HIGHER SPOUSAL AGE DIFFERENCE CAUSES HIGHER AND EARLIER FERTILITY AMONG ADOLESCENT GIRLS: AN EVIDENCE FROM BANGLADESH DEMOGRAPHIC AND HEALTH SURVEY

M A Islam*, F Misu and S M Sayem

Department of Agricultural Statistics, Bangladesh Agricultural University, Mymensingh-2202, Bangladesh

Abstract

Higher spousal age difference may sometimes instigate dominancy by husbands in different reproductive health decisions, especially when the wives are much younger, leading to unfavorable health outcomes. This study aims to investigate the likely effects of higher spousal age difference on fertility behavior among married adolescent girls in Bangladesh using Demographic and Health Survey 2007. It is hypothesized that adolescents with comparatively older husbands tend to get more children and have children earlier than their counterparts. Alongside bi-variate analysis this research employs binary logistic regression and Poisson regression models to identify the determinants of different fertility behaviors. About 43 % of the adolescents were married before the legal age (18 years) at marriage for girls in Bangladesh. About 22.3 % of the adolescents had spousal age difference 5 years or less. Almost half (47 %) of the married adolescents have their first child within one year of marriage. Poisson regression model suggested that the relative risk of having children among adolescent with spousal age difference 5 years or less was 0.554 compared to the adolescents with spousal age difference more than 15 years. The relative risk increased to 0.730 for spousal age difference between 6 - 10 years. Binary logistic regression model suggested that adolescents having spousal age difference 16 years and above were 3.227 times significantly more likely to have their first child within one year of their marriage compared to adolescents having spousal age difference 5 years or less. This study confirms that higher spousal age difference influences both timing and number of birth among married adolescents, hence recommends for special interventions.

Keywords: Adolescents, fertility, logistic regression, poisson regression, spousal age difference.

Introduction

In Bangladesh average spousal age difference is still high (Islam, 2008). Data analysis of Bangladesh Demographic and Health Survey 2014 (NIPORT *et al.,* 2016) reveals that the average spousal age difference in Bangladesh is 8.96 years (standard deviation=5.69). High spousal age difference shows different reproductive outcomes, especially among the married adolescent girls. This is because older husbands use to take reproductive decisions alone and try to compensate for delayed marriage. Thus spousal age difference may have a significant effect on inter-spousal communication and consequently in the number and timing of children. This also indicates that many couples especially with higher age difference in Bangladesh do not share their ideas and opinion regarding their contraceptive choices and reproductive preferences (Islam *et al.,* 2010). Besides this inherent mechanism there are also several socio-economic factors which can be also referred to as fertility determinants. So to capture the full picture of fertility preference consideration of all these factors are essential.

It is evident in developing countries that men and women desire fairly large families. However, their fertility preferences vary in some aspects. Generally, husbands desire more children than their wives with a shorter difference (Mahmud and Ringheim, 1997). Husbands usually play a dominant role in predicting the couple's contraceptive behavior when the number of living children is less. On the contrary, wives become more important in reproductive decisions with the increase in the number of children (Bankole and Singh, 1998). Child mortality is one of the variables that contributes to high fertility. Couples who have lost their child try to replace the dead child

---

*Corresponding author: M A Islam, *Department of Agricultural Statistics, Bangladesh Agricultural University, Mymensingh-2202, Bangladesh. E-mail: maislam_soton@yahoo.com*

(Bankole, 1995). Also if the sense of insecurity about the survival of living children is perceived by the parents they are more inclined to increase the number of children.

Early marriage is also an important determinant of fertility. It is understandable that women who marry at a younger age are more likely to produce more children than women who marry late unless a successful family planning program is in place. Study reveals that with the increase of the adolescents' age by one year the age at first birth is postponed by 0.728 years (Kabir *et al.,* 2001). Furthermore, it is well documented that in the countries where contraceptive use has already reached moderately high levels greater impact in reducing population growth may be achieved only by increasing age at childbearing than further reducing the fertility rates (Nahar *et al.,* 2013; Bongaarts, 1994). Studies on women empowerment suggests that high prevalence of contraceptive among married women is achieved mainly through their education and access to mass media. Such findings emphasized the importance of gender inequality in determining fertility control behavior (Caldwell and Caldwell, 2003).

Education is more or less inversely related with fertility. Educated women take participatory role in contraceptive decision-making as well as regarding the fertility behavior. However, this mechanism works through partner communication, since educated couples are better able and more likely to discuss issues like family planning (Islam *et al.,* 2010; Saraswati and Mukherjee, 2012).

Literature on sociology of religion argues that religious affiliation may have both direct and indirect effects on fertility. Its direct effects are the influences of the doctrines that impose restrictions on contraceptive use, abortion, pre-marital sex etc. Though not universal, Muslims women are more likely to have higher number of children than their non-Muslim counterparts. There are evidences that Muslims tend to desire more children and are less likely to use contraception which is mostly because of religious superstition (Chamie, 1981). In such situation a woman desiring to use contraception may be discouraged by her husband. The indirect effect of religion also lies with the same doctrines that emphasize traditional gender and family values that are favorable to high fertility.

Although several studies have been conducted to identify determinants of high and early fertility among adolescent girls, this study hypothesized and tested the impact of spousal age difference on fertility behavior of married adolescent girls. The specific objective of this study is to investigate if higher spousal age different influences the timing and number of births among married adolescent girls.

Materials and Methods

Data: Bangladesh Demographic and Health Survey (BDHS) 2007 (Niport *et al.,* 2009) dataset was used in this study. BDHS is a two-stage nationally representative survey which covers six administrative divisions and all the 64 districts. In rural areas *upazilas* are divided into *unions* and then *mauzas*, a land administrative unit. Urban areas are divided into *wards* and then *mahallas*. A total of 361 primary sampling units (PSUs) were selected in the first stage of sampling including 227 rural PSUs and 134 urban PSUs. A household listing operation was carried out in all selected PSUs from January to March 2007. The resulting lists of households were used as the sampling frame for the selection of households in the second stage of sampling. On average, 30 households were selected from each PSU, using an equal probability systematic sampling technique. In this way, 10,819 households were selected for the sample. A total of 10146 currently married women aged 10 - 49 years were selected and interviewed. A sub-sample (N=1294) of currently married women aged less than 20 years was selected as the basis of this study.

Methods: This study used a Poisson regression model to identify if the spousal age difference has any significant effect on the fertility among the married adolescent girls. The dependent variable was children ever born.

In the simplest case with a single independent variable x, the model takes the form:
$$\log(E(Z|x)) = a + bx$$

Furthermore, a binary logistic regression model was fitted to identify if higher age difference between spouses has any significant influence on early child bearing (having child within one year of marriage or after one year of marriage).

Binary logistic regression estimates the probability that a characteristic is present (e.g. estimate probability of "success") given the values of explanatory variables, in this case a single categorical variable; $\pi = \Pr(Y_i = 1 | X = x)$.

Let *Y be* a binary response variable

$Y_i = 1$ if the trait is present in observation (person, unit, etc...) *i*
$Y_i = 0$ if the trait is NOT present in observation *i*

$X = (X_1, X_2, ..., X_k)$ be a set of explanatory variables which can be discrete, continuous, or a combination.

If x_i is the observed value of the explanatory variables for observation *i*. The model is as follows-

$$\pi_i = Pr(Y_i = 1 | X_i = x_i) = \frac{\exp(\beta_0 + \beta_1 x_i)}{1 + \exp(\beta_0 + \beta_1 x_i)}$$

$$\text{or } logit(\pi_i) = \log(\frac{\pi_i}{1 - \pi_i}) = \beta_0 + \beta_1 x_i$$

For k number of independent variables the model can be generalized to

$$logit(\pi_i) = \log(\frac{\pi_i}{1 - \pi_i}) = \beta_0 + \beta_1 x_{i1} + \ldots + \beta_k x_{ik}$$

The key independent variable, spousal age difference was categorized into four categories as i) less than or equal to 5 years, ii) 6 - 10 years, iii) 11 - 15 years, and iv) 16 years and above. Other independent variables considered were education, religion, wealth index, area of residence and division.

Results and Discussion

The data analysis suggested that 43.5 % of the married adolescent girls were aged less than 18 years (Fig. 1), the legal age at marriage for girls in Bangladesh. Roughly 38 % of them were primary or less educated (Fig. 2). Among the adolescent girls 43.6 % had no children (Fig. 3). About 22.3 % of the married adolescent girls had spousal age difference 5 years or less. Another 49.3 % had spousal age difference between 6 to 10 years (Fig. 4). Almost half (47 %) of the married adolescents have their first child within one year of marriage.
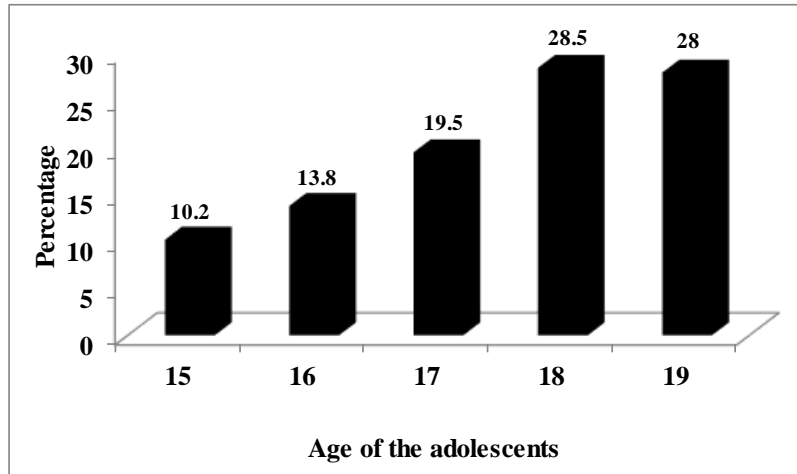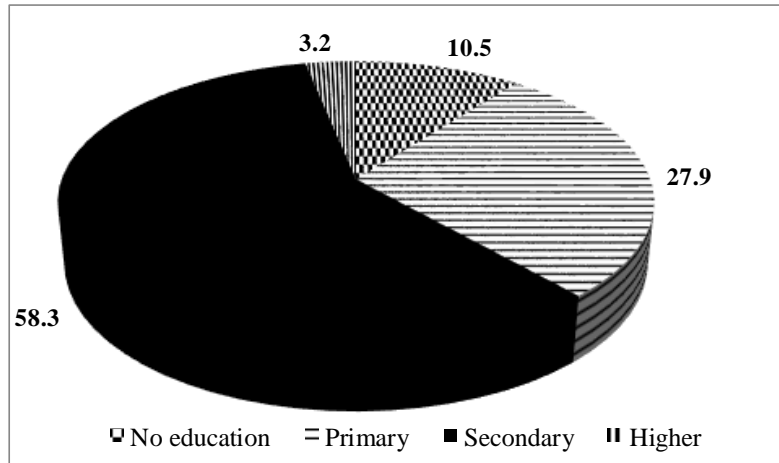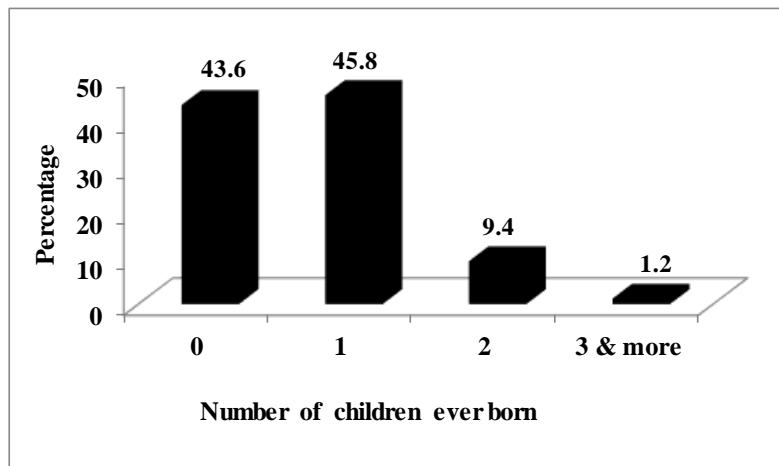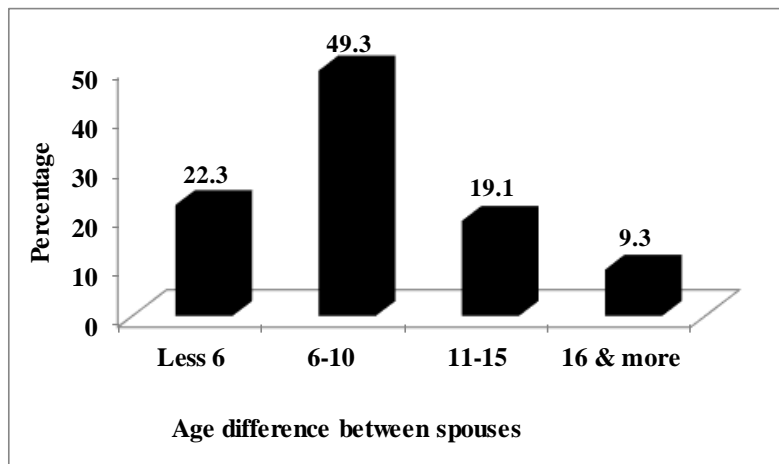

Fig. 1. Age distribution of adolescent girls (%).

Fig. 2. Education level of adolescent girls (%).

Fig. 3. Total children ever born among adolescent girls (%).

Fig. 4. Age difference (year) between spouses (%).

A Poisson regression model revealed that age difference between spouses has significant influence on fertility. The relative risk of having children among adolescent girls with spousal age difference less than or equal to 5 years was 0.554 compared to the adolescents with spousal age difference more than 15 years. The relative risk increased to 0.730 and 0.835, respectively for spousal age differences between 6 - 10 and 11 - 15 years (Table 1). Other important predictors of fertility were wealth index, husband's education, and religion. The results suggest that the lesser the husband's education level the higher the relative risk of having a children among the adolescent girls. Similar is true for wealth index; the poorer the economic condition the higher the relative risk of having a children among the adolescent girls.

Table 1. Poisson regression estimates of the effects of different socio-economic and demographic factors on children ever born among married adolescent girls in Bangladesh.

Independent variables	*β*	*S.E.*	Relative risk
Husband's Education (*r*: Higher)			
No education	0.526^{***}	0.172	1.693
Primary	0.471^{***}	0.162	1.601
Secondary	0.320^{***}	0.159	1.377
Wealth Index (*r*: Richest)			
Poorest	0.286^{**}	0.143	1.331
Poorer	0.253^{*}	0.129	1.288
Middle	0.165	0.128	1.180
Richer	0.162	0.123	1.176
Religion (*r*: Others)			
Islam	0.337^{**}	0.149	1.401
Age difference between spouses (*r*: 16 and above)			
less than 6 years	-0.591^{***}	0.128	0.554
6 - 10 years	-0.315^{***}	0.122	0.730
11 - 15 years	-0.181	0.122	0.835

Note: Level of significance *** p< .01; ** p < .05; * p< .10. The model is controlled for Division, Area of Residence and Wife's education which were insignificant and hence not shown in the table.

A binary logistic regression model suggested that adolescents having spousal age difference 16 years and above were 3.227 times significantly more likely to have their first child within one year of their marriage compared to adolescents having spousal age difference 5 years or less (Table 2).

Adolescents who belong to Islam were 4.698 times significantly more likely to have their first child within one year of their marriage compared to adolescents belonging to other religion (Table 2). It was also illustrated, though not significant, that adolescents having no education, no education of partner, and living in different divisions of Bangladesh other than Sylhet were more likely to have their first child within one year of their marriage when controlled for other variables (Table 2).

Childhood marriage for girls, especially in rural Bangladesh is still prevailing despite many legal and financial efforts by the government. In most of these cases the age difference between spouses remains high. These married adolescents do not have proper knowledge about family planning and reproductive health matters. Again, due to huge age difference husbands become dominant over many of the reproductive health decisions. These findings corroborate with other studies (Mahmud and Ringheim, 1997; Bankole and Singh, 1998; Kabir *et al.,* 2001). The current study accepted the hypotheses that adolescents girls having older husbands tend to get more children and have children earlier than their counterparts partially confirming the study by Kabir *et al.* (2001) and Mahmud and Ringheim (1997). Such a situation suggests that adolescent girls are more vulnerable to reproductive health complications. In Bangladesh there are campaigns to increase the marital age for girls as well as boys but no such efforts to highlight the negative impact of spousal age difference on fertility, consequently on reproductive health of the adolescent girls, are evident. This issue should be incorporated in the ongoing family planning and reproductive health program with proper intervention through mass media. Increasing husband's education level and awareness about reproductive health may help the process (Saraswati and Mukherjee, 2012). The effect of religion, especially

traditional Muslim beliefs and practices, on early child bearing and higher fertility among adolescents is somewhat reflected in other studies (Chamie, 1981) and may be addressed by motivating religious leaders. As a whole these steps have influences the fertility of the adolescent girls in Bangladesh. Despite some important findings this study do have its limitations. As this study used a subsample generated from BDHS data the sample size becomes small. Also this study is restricted to the variables collected by BDHS. An independent survey with relatively larger sample should be carried out to formulated better policy options.

Table 2. Logistic regression estimates of the effects of different socio-economic and demographic factors on timing of child bearing among married adolescent girls in Bangladesh.

Independent variables	β	S.E.	Odds Ratio
Age difference category (r: 5 or less)			
6 - 10	0.421	0.244	1.523
11 - 15	0.298	0.302	1.347
16+	1.172***	0.338	3.227
Religion (r: others)	1.547***	0.505	4.698
Division (r: Sylhet)			
Barisal	0.804**	0.397	2.235
Chittagong	1.131***	0.354	3.098
Dhaka	1.012***	0.352	2.750
Khulna	1.370***	0.373	3.935
Rajshahi	1.304***	0.352	3.683
Types of place of residence (r: Rural)	-0.308	0.217	0.735
Highest education level (r: Higher)			
No education	1.045	0.842	2.844
Primary	0.966	0.813	2.628
Secondary	0.494	0.795	1.639
Wealth index (r: Richest)			
Poorest	-0.005	0.366	0.995
Poorer	-0.153	0.335	0858
Middle	0.186	0.332	1.205
Richer	-0.193	0.329	0.825
Partner's education level (r: Higher)			
No education	0.727	0.445	2.069
Primary	0.626	0.420	1.871
Secondary	-0.252	0.422	0.777
Constant	-4.741***	1.040	0.009

*Note: Level of significance *** p< .01; ** p < .05.*

References

Bankole A. 1995. Desired fertility and fertility behavior among the Yoruba of Nigeria: a study of couple preferences and subsequent fertility. Popul. Stud. 49(2):317-328.

Bankole A and Singh S. 1998. Couples' Fertility and Contraceptive Decision-Making in Developing Countries: Hearing the Man's Voice. Int. Fam. Plann. Perspect. 24(1):15-24.

Bongaarts J. 1994. Population policy options in the developing world. *Research Division Working Paper* No. 59. New York. The Population Council.

Caldwell B K and Caldwell J C. 2003. Below-replacement fertility: Determinants and prospects in South Asia. J. Popul. Res. 20(1):19-34.

Chamie J. 1981. Religion & Fertility: Arab Christian- Muslim Differentials. Melbourne: Cambridge University Press.150p.

Islam M A, Padmadas S S and Smith P W F. 2010. Understanding family planning communication between husbands and wives: a multilevel analysis of wives' responses from the Bangladesh DHS. Genus. 66(1):1-15.

Islam M A. 2008. Male involvement in reproductive health in Bangladesh: A multilevel analysis. VDM Publishing House Ltd, Germany. 176p.

Kabir A, Barbhuiya M A K and Islam M S. 2001. Determinants of Fertility in Bangladesh: Evidence from the Three National Surveys. Sciences. 1(5):302-307.

Mahmud N and Ringheim K. 1997. Knowledge, Approval and Communication about Family Planning as Correlates of Desired Family among Spouses in Pakistan. Int. Fam. Plann. Perspect. 23(3):122-129.

Nahar M Z, Zahangir M S and Islam S M S. 2013. Age at first marriage and its relation to fertility in Bangladesh. Chinese J. Popul. Res. Env. 11(3):227-235.

NIPORT, Mitra and Associates and ORC Macro. 2009. Bangladesh Demographic and Health Survey 2007. National Institute of Population Research and Training (NIPORT), Mitra and Associates and ORC Macro, Calverton, MD.

NIPORT, Mitra and Associates and ICF International. 2016. Bangladesh Demographic and Health Survey 2014. National Institute of Population Research and Training (NIPORT), Mitra and Associates and ICF International, Rockville, Maryland, USA.

Saraswati L R and Mukherjee P. 2012. Women's Autonomy and Utilization of Family Planning Services in Three Eastern States of India. In: Pal M, Pathak P, Bharati P, Ghosh B and Majumder A (Eds.). Gender Issues and Empowerment of Women. Nova Science Publishers. New York, pp.61-81.